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(12) United States Patent Kelly et al.

(54) TRANSMISSION SYSTEM

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(56) References Cited

U.S. PATENT DOCUMENTS

5,651,435 A	*	7/1997	Perosky F16D 23/06
5,666,806 A	*	9/1997	192/219 Dietz F15B 21/087 60/327

(Continued)

FOREIGN PATENT DOCUMENTS

CN	1076411	9/1993	
DE	19948392	5/2000	
	(Continued)		

OTHER PUBLICATIONS

International Search Report and Written Opinion, PCT/EP2013/063069 (2013).

(Continued)

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(57) ABSTRACT

A transmission system (8) comprising at least one floating gear (14a, 16a, 18a) rotationally mounted upon a first shaft the system comprising a floating gear activation system for controlling torque transfer between the at least one floating gear (14a, 16a, 18a) and the first shaft (10), the gear activation system comprising a first device (28, 30) having a friction interface (28) for frictional engagement with a friction interface (30) disposed on a first side of the at least one floating gear (18a), and a second device (25, 26) having a locking interface (25) for an interpositional engagement with a locking interface (26) disposed on a second side, opposing the first side, of the at least one floating gear (18a), whereby the floating gear (18a) is rotationally coupleable to (Continued)

